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classed as of contemporaneous age with the undoubted glacial deposits at Hendon, Finchley, and on the slopes of the Brent valley. Mr. Hicks is therefore satisfied that man lived in the neighborhood of the Thames valley in the early part of the Glacial period, probably in pre-Glacial times. (*Geol. Mag.*, July, 1891.)

BOTANY.

Botany at the Washington Meetings.—From the 12th until the 29th of August there were almost constant sessions of scientific men in Washington at which botanical papers were presented. In the first place, the Association of the American Agricultural Colleges and Experiment Stations held a four days' convention, and during the opening session there was a report from the chairman of the botanical section of the work done at the various stations by the botanists thus employed. It was evident from this report that while systematic botany, making of collections, and the field study of various plants were important features, the main one in several states is the study of the fungous enemies of cultivated crops. In the meetings of the section of botany much time was spent in a consideration of the question of an exhibition to be made by the stations at Chicago in 1893. The work in botany will be divided, and those workers best able to exhibit fungi of the cereals will have them in charge, while others take the fruits, etc. Professor Tracy, of Mississippi, is chairman of the Botanical Committee of the Columbian Exhibition.

Professor Atkinson presented a paper upon the cotton fungi, and exhibited several oil paintings of diseased leaves showing the rust, blight "frenching," etc. The question of the importance of common names for fungi came up, and was discussed, with the conclusion that finely illustrated bulletins are the best way to overcome the difficulty. Professor Alwood presented two papers, one upon an apple-leaf blight which is very destructive in Virginia, and the results of his successful crossing of wheats. Many specimens of the latter were shown, and a lengthy discussion followed. A bacterial disease of the cabbage was reported upon by Professor Garman, while Professor Crandall exhibited a quantity of Rocky Mountain June berries, and spoke of them as one of the coming fruits for Colorado. Professor Brewer exhibited some hybrid butternuts, and Professor Halsted presented a paper upon the germination of spores of species of fungi.

During the sessions of the College and Station Association, Mr. R. Worthington, F.C.S., of Rothamsted, England, delivered six lectures, a large portion of which was made up of botanical matter. The microbes, for example, that take an active part in the nitrification of the soil were shown, enlarged by lantern projection upon a screen, as also were some other forms of bacteria of great interest to agriculture.

During the two days of the meetings of the Society for the Promotion of Agricultural Science there were many botanical papers. Thus Professor Arthur presented the results of field experiments under the title of "A Physiological Basis for the Comparison of Potato Production." Many practical points were developed. Professor Beal considered the description of varieties of strawberries and raspberries. Additional information was presented by Professor Burrell upon the bacterial disease of potatoes that is now quite widespread throughout the country. Professor Forbes treated of a bacterial disease of the chinch bug, while Professor Kedzie still further considered bacteria in his paper upon soil extract in relation to development of tubercles on clover roots. Injurious fungi received attention at the hands of Professor Galloway, who gave results of some experiments made the present year in the treatment of plant diseases, while Professor Halsted outlined conclusions from soaking seed beans to check anthracnose. Professor Green considered arsenic and copper as a fungicide and insecticide, and also gave the results of a treatment of raspberry anthracnose with fungicides. Professor Taft reviewed his work with fungicides for apple scab, and Professor Pammel considered some of the conditions which modify the appearance of parasitic fungi in plants.

The opening day of the American Association for the Advancement of Science had its full share of botany. President Coulter, as chairman of the section of biology, gave an address upon the future of systematic botany, and in the evening Dr. Goodale, as retiring president, unfolded the possibilities of economic botany. These excellent addresses the reader will peruse with much profit as presented in the scientific journals.

On Thursday, at the first meeting of the Botanical Club, Professor Arthur explained the working of some apparatus to be used in physiological botany; Professor Halsted spoke of a fungous disease of the egg-plant; Professor Atkinson showed the connection between a cercospora and sphærella; while Professor Pammel considered some conditions favoring the growth of fungi. In the discussion the importance of making yearly notes of important species was mentioned. Professor Fernow spoke of the value of a national arboretum, and resolutions were offered favoring it. In Section F Professor Atkinson presented a paper upon the structure and dimorphism of *Hypocrea tuberiformis*. Professor MacFarland, of Edinburgh, added another chapter in the history of the Venus fly-trap;

specimens illustrating the peculiar quality of irritability possessed by these plants were shown and the subject discussed. Professor Campbell gave a paper on the prothallium and embryo of *Osmunda claytoniana* and *O. cinnamomea*, fully illustrated by blackboard drawings. A new nectria found upon the sweet potato and associated with the stem rot was treated of by Professor Halsted. The Compositæ collected by Dr. Palmer in Colima, and the flora of Carmen Islands, were two papers by Professor Rose. Professor T. Smith illustrated fully the uses of the fermentation tubes in bacteriology by a score of specimens, many containing important disease germs.

On Friday, during the morning hour for the Botanical Club, papers were presented by Professor Fairchild on a new currant disease, by Professor Riley upon Mexican jumping beans, by Professor Rose upon two new weeds, while one of the most enjoyable features was the presentation to the members of the club of a souvenir by the Washington Botanical Club, consisting of twenty-two photographs of Washington points of interest, neatly bound. In the biological section notes upon bacteria of Cucurbits by Professor Halsted were followed by the four papers of the physiological series prepared by appointment, as follows: "Transportation or Loss of Water in Plants," by Professors Bessey and Woods; "Movements of Fluids in Plants," by Professor Beal; "Absorption of Fluids by Plants," by Professor Pammel; and "Gases in Plants," by Professor Arthur. After some discussion, and particularly as to the absorption of carbonic gas in soil water by roots, the botanical papers for the day in the section closed with notes upon an anthracnose by Professor Halsted. The botany for the day, however, was continued far into the evening by Professor John M. MacFarland, who gave a public lecture upon heredity in plants, by which it was shown with a series of three simultaneous lantern projections that the differences in the parents were blended in the offspring even to the size of cells, ducts, thickness of bark, and many other microscopic details.

On Saturday, at the Botanical Club, the first paper was read by Miss Southworth, on some strange fungi. Dr. Mohr gave a contribution upon some phanerogams of Alabama. A novel method of caring for Myxomycetes was explained by Professor Cook, and Mrs. Claypole gave a paper upon an onion disease. In Section F Professor Riley treated of microörganisms as insecticides, followed by further observations on a bacterial disease of oats by Professor Galloway. Dr. Vasey outlined the botanical field work of his division, while Professor Waite presented results from recent investigations of pear blight. The spectroscope in bacterial studies, by Professor Brashear, closed the long list of botanical papers presented at Washington.—Byron D. Halsted.